Allied Telesyn International Ethernet Network Adapter

For ISA Bus Computers and IEEE 802.3 Compliant LANs

User Manual

AT-1700T Plus for Twisted Pair Media
AT-1700AT Plus for AUI Port Adapter and Twisted Pair Media
AT-1700BT Plus for Thinnet Coaxial and Twisted Pair Media
AT-1700FT Plus for Fiber Optic and Twisted Pair Media

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All Countries: Install in accordance with Local and National Electrical Code.

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Lé présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de le Classe A. Prescrites dans le réglement sur le brouillage radioélectrique edicté par le ministére des Communications Du Canada.

Contents:

Figures:

Tables:

Chapter 1
Square One

What You Get From Us

When opening this ATI product, make sure that the package you have received is complete and in good condition. The package should include:

❑ Ethernet network adapter card
❑ CardAssistant diskette
  —CardAssistant setup and diagnostic test program
  —Network adapter card drivers
  —Support files for network software
  —readme files
❑ Manual
  —CardAssistant quick reference
  —Network management summary
  —Technical support fax order form
  —Warranty/registration cards

What *Else* You Need to Connect to the Network

You must have an IBM-PC-or-compatible computer with the following specification:

❑ ISA bus (or EISA bus) computer
❑ Approximately 32K of available RAM for the driver, depending on the driver installed

❑ 512K of available RAM when running ATI CardAssistant setup/diagnostics software

❑ A free 32-byte block of I/O at 240h, 260h, 280h, 2A0h, 300h, 320h, 340h or 380h

❑ An available interrupt (IRQ 3, 4, 5, 9, 10, 11, 12 or 15)

❑ Compatible workstation operating system and network system software

In addition to your workstation hardware, you must provide network administration software like Novell's NetWare, Microsoft LAN Manager, Sun PC-NFS or Banyan Vines. You must also provide the necessary cables, connectors and terminators.

Where to Read From Here

If you are a first-time network user, and you just need to set up and connect your PC to the net as a workstation, you should read Chapters 2 and 3. These chapters are tailored to your needs, and typically will get you up and running with minimal difficulty.

If you are an experienced network installer, and will be setting up multi-adaptor workstations with large network bandwidth requirements, or servers, or some other complex network configuration, go to Chapter 4. Chapters 4 through 8 will have the information you need.

Chapter 2
Networking Overview for the New User/Installer

More and more often, non-technical computer users are called on to install new software and hardware on their computers. Frequently, the documentation accompanying the hardware/software assumes the installer is experienced with PC installations in general, and installation of the manufacturer's type of equipment in particular. Often, this is not the case.

To resolve that conflict, this chapter will explain in general terms what the ATI network adapter card is, what it does, and how it plays with the rest of the system.

The Network Adapter Card

The network adapter card may be considered to be a "two-sided" device, that plugs into a vacant card slot inside your computer. One "side" of the device can talk to your computer, through the slot it plugs into. The other "side" of the adapter card talks to an external connector and a network of cables and/or optical fibers that is in turn connected to other adapter cards, and therefore other computers.

Network Software

Before you can use this connectivity, you must have software installed on your personal computer (PC) that can utilize your network connection. This software may be Novell NetWare, Microsoft Windows for Workgroups, Sun PC-NFS, Banyan Vines, or other similar software packages.

Your network software also requires some additional software, a special "interpreter", which allows your network software to talk to the particular network adapter card you have installed in your PC. This interpreter software is called a driver, and a different driver is required for each network software/network adapter card combination. ATI has supplied you with drivers for most common network software. These drivers are on the CardAssistant diskette, and are selected and installed by the SETUP17 software on that diskette.

Configuration

One more set of conditions must be satisfied before your adapter card can use your network; the network adapter card must know where, within your PC, it is. In the same sense your house uses an address, a unique house number, and a unique phone number to interface with the outside world, so does your network adapter card use unique numbers to describe its logical location inside your PC.

Only when your network software knows the unique numbers that describe your adapter card's location can communications begin. The numbers will be, literally, one or two addresses and an interrupt request number (an IRQ). It's not really necessary to understand what these numbers mean; it's only necessary to verify that they're unique within your PC. ATI has supplied you with software to help you define these numbers and establish their uniqueness.

In summary, your networked PC will function properly on the network if the following are true.

—**You have a network adapter card in your PC**
—**The adapter card has unique address(es) and IRQ**
—**You have network software installed**
—**Your adapter card is properly connected to the network**
—You have a driver installed for your particular network software/network adapter card **combination**

Immediately following this chapter is a simplified installation procedure which will yield successful installation in a large percentage of cases.

Chapter 3

A Simplified Hardware/Software Installation Procedure

Two Installation Contexts

Installation of your ATI network adapter card may be performed within two distinct contexts. In the first context, the installation conditions are "common", and the installation is simple and quick. In the second context, the installation conditions are complex and may include many differing hardware and software configurations. In this complex context, it is advisable to have an installer skilled and knowledgable in network hardware and software, their permutations and their interactions.

The majority of network hardware/software installations are within the first context, the installation of one network adapter card with common software on simply-configured ISA-bus PC workstations. Within this context, the new installer/user can *usually* install, configure and connect the network adapter card and associated software.

Although *usually* is the operative word in the previous statement, and the quick installation does not succeed in every case, the benefits of installation by available non-technical personnel are frequently great in terms of lost time.

The following procedure is designed to install your ATI network adapter card and its associated software on *most simple systems*. If you are unable to get your network connection operating with this quick procedure, you must perform the general-purpose installation, as described in Chapter 5.

▷ **Installing the Adapter Card**

Refer to the computer's manual for information on installing card-cage accessories.

Warning ⚡	High voltages inside the computer present a safety hazard. Make sure the power is OFF before removing the cover.

Caution ⚠	This LAN adapter card is for use only with IBM AT or compatible UL listed personal computers that have installation instructions detailing installation of card-cage accessories. Installation should be performed with precautions to prevent damage to static-sensitive components.

Install the AT-1700 interface adapter card in an expansion slot in your computer, as per the manufacturer's instructions. Note that this is a 16-bit (long) card, and will not install in an 8-bit (short) expansion slot.

If your card has the optical fiber connections, card installation may be made easier by slipping the protective plastic caps off the optical connectors.

▷ Installing the Workstation Software

1. Turn your computer on.

2. Install the ATI CardAssistant diskette in a floppy disk drive, typically drive a: or drive b:. If the diskette is in drive a:, type `a:setup17` ⦅RETURN⦆. By inference, if the diskette is in `b:`, type `b:setup17` ⦅RETURN⦆. The CardAssistant software menu will appear on the screen.

3. Type `I` ⦅RETURN⦆ to open the Install System Software menu, and use the ⬆ and ⬇ keys to highlight the appropriate workstation driver. For instance, if your network software is Novell® NetWare®, and your computer is a DOS machine, you would highlight
   `NetWare DOS Workstation (ODI).`
   If your network software is Microsoft LAN Manager, and your computer is an OS/2 machine, highlight
   `LAN Manager OS/2 Workstation` or `Server (OS/2 NDIS).`

4. Type ⦅RETURN⦆ to accept the driver type, ⦅RETURN⦆ to install the network software in `c:\net` on your hard disk, and ⦅RETURN⦆ to read the Readme file.

5. Type `C` ⦅RETURN⦆ to open the Configure I/O Parameters menu and ⦅F10⦆ to store these values on your adapter card. This assumes that your adapter card is new, and has never been installed before, and therefore has the default values in this menu. These default values are, in order, 300h, 15, UTP 100 Ω, and AUTO SELECT (on BT, AT, and FT). The remaining values are immaterial to the installation.

6. Type ⦅RETURN⦆ and ⦅ESC⦆ to leave the CardAssistant software.

7. Install your Novell, Sun, Microsoft, Banyan, etc. software according to the manufacturer's installation procedure. Connect the network cable to the proper connector on the network adapter card you just installed in your PC. If your

network software is able to communicate with the network, you have successfully installed and configured your network hardware and software.

If you are unable to communicate with the network, or if any of the previous installation/configuration processes have not been successful, you must now go to the universal installation in Chapter 5.

Chapter 4
The AT-1700 Network Card

The ATI AT-1700 16-bit Ethernet Adapter Card provides a PC access to an Ethernet Local Area Network (LAN) for communicating and sharing computer resources. The AT-1700 offers full compliance with IEEE 802.3 specifications. The card comes with ATI CardAssistant configuration and diagnostic software. The CardAssistant diskette also includes the adapter card drivers you need for networks running Novell® NetWare® or Microsoft® LAN Manager™ or Windows for Workgroups™ network software. These drivers include:

❑ ODI drivers for use with a workstation on a Novell NetWare network

❑ NDIS drivers for Microsoft LAN Manager, Windows or TCP/IP

❑ A packet driver for TCP/IP

❑ IPX, ODI and NDIS drivers for servers.

See the `read.me` file on the CardAssistant diskette for the complete list of drivers.

Up to four AT-1700 adapter cards can be installed in a single server.

10BASE-T, 10BASE2, 10BASE5 or 10BASE-FL Choices

The AT-1700T, BT, AT and FT versions all have an RJ45 receptacle for connection to 10BASE-T network segments. The AT-1700 is compatible with 100 Ω Unshielded Twisted Pair (UTP) or 100 Ω or 150 Ω Shielded Twisted Pair (STP) wire. The AT-1700AT supplements the RJ45 with an Attachment Unit Interface (AUI) to which 10BASE2, 10BASE5 or 10BASE-FL, an extension of the earlier Fiber Optic Inter-Repeater Link (FOIRL) specification, may be adapted by adding the appropriate transceiver. The AT-1700BT has a BNC connector—in addition to the RJ45—for direct connection, with T-connector and terminator, to a 10BASE2 Ethernet segment (thin wire Ethernet or "cheaper net"). The AT-1700FT includes ST-type transmit and receive connectors for fiber optic media.

Auto or Pre-Set Port Selection (BT, AT and FT)

An auto port-select option configures the AT-1700BT, AT or FT to sense which of its two ports is connected. In auto mode, the factory default mode, the card checks to see if the twisted-pair port is connected. If not, it attempts to use the other port. The alternative is to pre-set the port selection using the CardAssistant configuration menu. In pre-set mode, both ports can remain connected to network segments of different media. The active port is the one selected in CardAssistant.

CardAssistant Software Performs Configuration

For setting I/O parameters, the CardAssistant configuration menu displays all parameter choices. Configuring the card for your PC workstation or server involves choosing menu options instead of moving hardware jumpers on the card.

Chapter 5
Installation

OS/Environment-Specific Installation Information

Accurate and current network hardware and software installation information changes with every network software package, protocol stack or operating system. To respond quickly and accurately to these changes, we have included the latest installation information in a series of applications- and OS-specific readme files on the ATI CardAssistant diskette.

The file \README.TOP, on the CardAssistant diskette, contains a guide to current readme files on that diskette, and is recommended reading for the installer.

▷ **Installing the card**

Use the following overview of card installation in conjunction with your network-software and computer manuals.

Caution ⚠	This LAN adapter card is for use only with IBM AT or compatible UL listed personal computers that have installation instructions detailing installation of card-cage accessories. Installation should be performed with precautions to prevent damage to static-sensitive components.

1. Check system requirements on page 1.
2. Consult instructions for adding peripherals in your computer's instruction manual.
3. Check I/O resources used by other peripherals.

TIP: *If there is not another network card in the computer, the default I/O settings are likely to work. Table 8 on page 40 lists some common conventions for ISA bus I/O.*

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4. Run CardAssistant configuration program to:
   — Check I/O parameter values (base address, IRQ, boot PROM address) and change as needed
   — Load and configure the driver for the network

▷ **Installing the card in an ISA or EISA slot**

Refer to the computer's manual for information on installing card-cage accessories.

Warning ⚠ High voltages inside the computer present a safety hazard. Make sure the power is OFF before removing the cover.

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1. Make <u>sure</u> the computer's power is turned OFF.
2. Pick the card slot you wish to use. Follow the manufacturer's instructions for adding a card.

TIP: *When installing the AT-1700FT temporarily remove the shields from the fiber-optics cable connectors to give the connectors more clearance.*

> **Note** 🖐 The card works in either a 16-bit ISA slot or an EISA slot. If you are not using an EISA slot, skip step 3.

3. Run your computer's EISA configuration utility and make a note of the I/O resources (I/O Address Range and Interrupt) available for the adapter card. Follow the EISA utility instructions, and insert the ATI CardAssistant diskette when the EISA utility asks for the vendor diskette.

   The EISA utility asks which I/O resources to reserve for the adapter card. You can refer to Table 1 on page 17 and record the settings you choose. Also note these settings on the Network Management Summary on the back of your Quick Reference Guide.

▷ Configuring with CardAssistant Software

Instead of hardware jumpers, the AT-1700 uses software settings to configure the card. The CardAssistant program's interactive mode lets you set these I/O parameters from menus of choices with your keyboard or mouse. The batch mode allows you to configure the card on a DOS or OS/2 command line. See "Running CardAssistant in Batch Mode" on page 19.

Note 👆 Launching the CardAssistant program requires that the card is present. If you have a driver running, you will not be allowed to open the Diagnostics window unless you have commented out the driver line in the batch file (for NetWare) or the DEVICE=drivername line in config.sys (for an NDIS driver) and restarted the PC. You may, however, enter the Configuration window and configure the adapter card, but the new values do not take effect until the PC is restarted.

▷ **Invoking CardAssistant**

1. If you are running CardAssistant from the installation software diskette, follow steps 2 and 3. If CardAssistant is installed on your hard disk, skip to step 4.

2. Insert the installation diskette into the appropriate floppy drive.

3. Type: *floppydrive*:setup17
   where *floppydrive* is the disk drive containing the CardAssistant program. Proceed to step 5.

4. CardAssistant is copied onto a hard disk when you install the driver for the adapter card. Once this is accomplished, you can type:
   path\setup17
   where *path*\ is the optional drive and directory.

5. The main menu comes up and you are ready to select one of the icons.

▷ Working with CardAssistant menus

You can use either the keyboard or mouse to:

❑ Make menu selections
❑ Change parameter settings
❑ Save or cancel your configuration changes

CardAssistant's main menu presents you with the choice of configuring the card, running diagnostics or installing a driver. Pop-up menus list the possible parameter settings, with the current setting highlighted. The message window under the menu lists available commands.

▷ To change AT-1700 default settings

Make sure the configuration of the card is compatible with the host before running diagnostics or attempting to load a driver. If there are no other interface cards present in the host, the likelihood of a conflict is slight. In this case, use the Auto Configure option. If the computer has other peripheral cards installed, you may need to change one or more I/O settings. To help avoid conflicts, Table 8 on page 40 lists typical ways that devices are configured.

TIP: *For future reference, use the Network Management Summary on the back of your Quick Reference Guide to record the configuration settings that were changed.*

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1. Invoke CardAssistant if necessary. See "Invoking CardAssistant" on page 15.

2. Choose "Configure I/O Parameters" or "Auto Configure" from the main menu. "Configure I/O Parameters" displays the card's current settings. "Auto Configure" proposes settings for you. Check the settings that are proposed, and, if necessary, select alternate settings from Table 1.

Table 1: I/O Configuration Settings

Parameter	Default	Alternate Settings
Base I/O Address	300h	240h, 260h, 280h, 2A0h, 320h, 340h, 380h
Interrupt Level	15	3, 4, 5, 9, 10, 11, 12
Boot ROM Base Address	Disabled	C4000h, C8000h, CC000h, D0000h, D4000h, D8000h, DC000h

3. You can use the mouse or arrow keys to select the parameters to be modified.

4. Press (ENTER) and a pop-up menu displays the choices for the parameter you have selected.

5. When you have chosen the setting you want, press (ENTER).

6. When you are satisfied with the selections for all parameters, press (F10) to accept your changes and leave the configuration menu.

Note In order to have the new configuration take effect, you must cycle power and reboot the computer.

After configuring the I/O parameters, you can either run the CardAssistant diagnostic software or go on to install the driver. Driver installation is covered in Chapter 6, "Network Adapter Card Drivers."

▷ **Running Diagnostic Checks**

Note ☜ If you have not cycled power and rebooted the computer since changing the configuration, diagnostics will run against the old settings.

The CardAssistant diagnostic routines test the board and the configuration for functional problems or conflicts with other devices. The routines are:

❏ PC bus interface
❏ On-board RAM
❏ Interrupt test
❏ Internal loopback
❏ MAC address
❏ Boot PROM

You can see if the board passes before connecting the computer to the network, and then confirm that it still passes after the network connector is plugged in. This method can help you isolate any problem.

▷ **Checking the AT-1700 configuration**

1. Invoke CardAssistant if necessary. See "Invoking CardAssistant" on page 15.
2. Select the Diagnostics menu. Type: d ⌧ENTER⌧.

The diagnostic routines display whether the card passed each test and report possible causes of any failures.

| Note | The drivers must not be loaded when the diagnostics routines are run, or the diagnostics results will be inaccurate. |

▷ Installing More than One Card

You can install up to four AT-1700 ATI adapter cards in the same computer. Each requires its own unique I/O resources (I/O port and IRQ). If more than one card is installed in the host when you run CardAssistant, the configuration window displays a column of settings for each. You can tell which column is for which card by checking the node address. The node address displayed agrees with the label on the card itself.

▷ Running CardAssistant in Batch Mode

| Note | If multiple AT-1700 boards are installed in the same computer, then interactive mode must be used to configure the boards. |

When you wish to prepare and configure several AT-1700 cards for users in an assembly-line approach, you can create a batch (.bat) file that invokes CardAssistant as follows:

    setup17 [*IOBase*] [*parameters*]

where *IOBase* is the base hexadecimal I/O address of the adapter (e.g., 300), and *parameters* is replaced with the parameters you wish to modify from their default values. If you intend to use the default value for a parameter, it may be omitted. Table 2 lists the parameters that may be set.

Parameters may be combined on the command line.

Table 2: Batch Mode Parameter Names

Parameter	Function
/Ix	x = interrupt level[1]
/UTP	selects the UTP (10BASE-T) port
/Tx	x = cable impedance for UTP connections
/BNC	selects the BNC port
/FIBER	selects the Fiber Optic port
/AUI	selects the AUI port
/AUTO	configures for automatic port selection
/T100	configures for 100 Ω UTP/STP cable
/T150	configures for 150 Ω STP cable
/Bxxxx	enables the boot PROM at address xxxx
/Bdisable	disables the boot PROM
/E	returns the number of AT-1700s installed

NOTE 1. For the range of values, refer to Table 1 on page 17.

Here are sample command lines for differing requirements:
```
setup17  0x300  /I15  /UTP /Bc8000 /T100
setup17  320h   /I5   /Bdisable /Fiber
```

The /E parameter is used by itself to prompt CardAssistant to count the number of AT-1700 cards in the computer rather than bring up the main menu.

▷ **Reconfiguring a Previously Installed Card**

If the card is working properly but you wish to reconfigure some of the I/O parameters, see "Configuring with CardAssistant Software" on page 14. When you launch CardAssistant, the configuration window shows the current settings for the card(s) installed.

If the card is not functioning correctly, the problem may be caused by a configuration that conflicts with other accessories installed in the workstation or server. In this case, refer to "Troubleshooting," Chapter 8.

Boot ROM Socket

The AT-1700 card is shipped with an unpopulated boot ROM socket. For a diskless workstation, the card needs a boot ROM to allow it to load the operating system over the network. If a ROM is installed, the Boot PROM Enable switch must be set in CardAssistant's Configuration menu.

Boot ROMs are application-specific. ATI supplies a range of boot ROMs for different network environments. Contact your ATI representative for more information.

Chapter 6
Network Adapter Card Drivers

Because user network environments are numerous, differing in network-management software, operating systems, and protocol stacks, a variety of adapter card drivers is necessary to operate an adapter card in a majority of environments. An ODI driver for NetWare running in DOS might be needed, or an NDIS driver for Windows for Workgroups or for LAN Manager running in OS/2, or a packet driver for PC/TCP in DOS.

The CardAssistant diskette has adapter card drivers for many different environments, as well as application-specific readme files and sample configuration files. Depending on your network, you will need to install the right driver and possibly merge it with your network software. Refer to the manuals supplied with your network software for the procedure for installing an adapter card driver. ATI maintains application information on our bulletin boards. See "Get Technical Support" on page 41.

Drivers for Workstations

For installing the card in a workstation, see Table 3.

Table 3: Which Driver to Use in a Workstation

Network Software	Card Driver Path\Filename
NetWare for DOS	\DOS\AT17ODI.COM
NetWare Lite	\NETWARE.ODI\AT17ODI.COM
Windows for Workgroups	\AT1700.DOS
LAN Manager 2.x for DOS	\MSLANMAN.DOS[1]...AT1700.DOS
LAN Manager 2.x for OS/2	\MSLANMAN.OS2[1]...AT1700.OS2
PC/TCP-compatible TCP/IP	\PKTDRV\AT1700.COM

NOTE 1. Driver in subdirectory: DRIVERS\ETHERNET\AT1700

Drivers for Servers

If you are installing the card in a server, bridge, router or brouter, refer to Table 4.

Table 4: Which Driver to Use in a Server, Bridge, Router or Brouter

Network Software	Card Driver Path \Filename
NetWare v4.0	\NETWARE.40\AT1700.LAN
NetWare v3.11	\NETWARE.386\AT1700.LAN
NetWare v3.1	\NETWARE.386\AT1700.LAN
NetWare v2.2	\$x$AT1700.OBJ ($x$ = A, B, C, or D)
NetWare v2.15	\$x$AT1700.OBJ ($x$ = A, B, C, or D)
LAN Manager 2.x for DOS	\MSLANMAN.DOS[1]...AT1700.DOS
LAN Manager 2.x for OS/2	\MSLANMAN.OS2[1]...AT1700.OS2

NOTE 1. Driver in subdirectory: DRIVERS\ETHERNET\AT1700

Driver Installation

The procedures for installing, binding or merging these drivers with the network software vary with the operating system type and version. In general, you install the adapter card driver during the course of installing the network software. For detailed instructions, refer to the LAN administration manuals for your network software.

> **TIP:** *Network software manufacturers' procedures and file structures are subject to change. This is why the adapter card manual can only provide general guidelines on installing drivers. Additional, more up-to-date installation notes may be found in the Read.me file on the CardAssistant diskette. But for accurate, detailed information on network installation, your network software manuals are your best source.*

▷ **General steps for installing a driver**

Use the CardAssistant program on the installation diskette to install the driver.

Note Network software should not be running on the computer when CardAssistant is invoked. To make sure that configuration works properly, comment out the network filenames in your CONFIG.SYS and AUTOEXEC.BAT files and then reboot, or boot from a floppy with no batch files.

1. Insert the diskette into the floppy disk drive and type:
   floppydrive:setup17 (ENTER)
   where *floppydrive* is the disk drive containing the installation diskette.
2. Select the "Installation" icon on the main menu.

3. Choose the appropriate driver from the menu choices. Following the instructions on the screen, copy the driver to a standard directory (for example LAN Manager customarily uses C:\LANMAN\DRIVERS\ETHERNET for a server).
The CardAssistant program will create the directory if it does not already exist. Exit the CardAssistant program.

4. Invoke the LAN utility for installing the network software.

5. Check settings of configuration options and make sure they match the card configuration (in Chapter 5, "Installation").

6. Copy network configuration files to the standard directory, and modify batch files (e.g., AUTOEXEC.BAT and CONFIG.SYS) to point to the network configuration files during reboot.

7. Complete the installation of the network software.

▷ **Updating a Novell IPX Workstation to ODI**

Individual Novell IPX workstations on NetWare systems are frequently converted to Novell Open Data-Link Interface (ODI) workstations running on the same system. This conversion is typically made because Novell no longer supports the IPX specification, and has replaced it with the ODI specification. Therefore, changing or updating network adapter hardware or software on an IPX workstation will probably involve changing the driver type from IPX to ODI.

Note The IPX-ODI change in no way impairs the workstation's ability to function with your original NetWare software on the original, unchanged network.

25

When you install an ATI network adapter card, and invoke the installation program `setup17.exe` on the ATI distribution diskette, all the files you need to effect the ODI installation are loaded onto your hard drive.

1. Run CardAssistant (`setup17.exe`) and follow the instructions for Install System Software, choosing `AT17ODI.COM` in the driver install field. CardAssistant, in its default mode, creates a directory called `\NET` on the workstation disk drive, copies `NET.CFG`, `NETX.EXE`, `AT17ODI.COM`, `IPXODI.COM` and `LSL.COM` files to that directory.

2. While still in CardAssistant, enter the Configure I/O Parameters window and configure the adapter card port. Once the card's port is configured, fill out the LAN Management Summary inside the front cover of this manual for future reference.

3. Exit CardAssistant.

4. Open the ASCII file `NET.CFG` with a text editor and verify that the following lines are there:
    ```
    Link Driver AT17ODI
       Port xxx
    ```
    where *xxx* corresponds to the base I/O address (in hex) in CardAssistant.

Note The word "Port" must be indented from the left margin under the Link Driver line by at least one space or one tab.

5. The batch file you use to get on the network must contain these lines *in the following order*:
   ```
   LSL
   AT17ODI
   IPXODI
   NETX
    login
   ```

6. Now reboot the computer to load the new configuration, and look for the driver's log-on message.

▷ **Installation note: NDIS for TCP/IP**

AT1700.DOS is the AT-1700 adapter card driver based on the Network Driver Interface Specification (NDIS) developed by Microsoft and 3Com. It is used for Microsoft LAN Manager applications, as well as implementations of Transmission Control Protocol/Internet Protocol (TCP/IP) such as PC-NFS from Sun Microsystems.

AT1700.COM conforms to the Packet Driver specification developed by FTP Software. It can be used for implementations of TCP/IP such as PC/TCP, concurrent with other protocol stacks.

Note Although the ATI drivers support multiple protocol stacks, it is important to have only one stack *of a given type* resident. For example, if you use the public domain IP protocol driver PROTMAN.SYS, you should not use another TCP/IP stack concurrently.

More information on installing the NDIS driver and the packet driver in different environments is available in the readme file on the CardAssistant diskette.

Support for Multiple Adapter Cards

You can have up to four AT-1700 adapter cards in a single computer (workstation or server). Each needs its own driver loaded (or the same driver loaded on a re-entrant basis). Consult your network software documentation for instructions on binding the drivers.
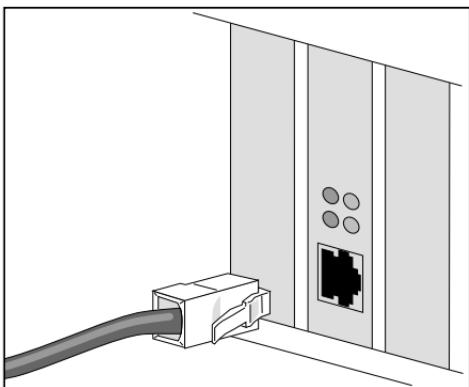
Chapter 7
Cabling

For complete rules of cabling and for information useful in planning network configurations, see ISO/IEEE Publication 8802-3. The AT-1700T is for use with 10BASE-T segments, using an 8-wire (4-pair) RJ45 jack for the network cable, shown in Figure 1.

Figure 1:
AT-1700T UTP Port and RJ45 Connector

Important 10BASE-T Cable Considerations

A serious problem exists concerning identification of modular cable. There are various grades of voice-quality and data-quality cables available. These can appear to be similar externally, and their DC characteristics are also similar, although their AC characteristics, and therefore high-speed data transmission characteristics, are radically different.

The identification problem is exaggerated by the fact that some suppliers have sold purportedly data-quality cables manufactured with voice-quality cabling.

If any voice-quality cabling is used in a 10BASE-T network system, data movement is slow, collision-prone or non-existent. To confuse the issue, the LINK indicator on the interface will usually indicate a valid link in such a case.

For the foregoing reasons, it is absolutely vital that all cabling used with the 10BASE-T adapter card connections is of level 3, 4, 5 or IBM type 1. As a rule of thumb, if a cable type is flat, it is typically untwisted, and will cause problems. If a cable is more or less round in section, it will typically work.

The six common modular cable specifications and their applicability to 10BASE-T network use are shown in Table 5, and cable schematics are shown in Figure 2.

Table 5: Usable and Unusable 10BASE-T Cable

Cable Level	Cable Description	AC Char.	Specifi- cation	Twist/ Foot	10BASE-T OK?
1	Unshielded untwisted	N/A	CCITT	none	NO!
2	Unshielded Indv.Twisted Pairs	100 Ω ±30 Ω	RS-232 1BASE5 AT&T PDS	none	NO!
3	Typ. Unshielded Indv. Twisted Pairs	100 Ω ±15 Ω	TI, AT&T ISDN 10BASE-T IBM Type 3	3-5	YES
4	Unshielded Enhanced Indv. Twisted Pairs	100 Ω ±30 Ω	EIA, TIA 10BASE-T NEMA	5-8	YES
5	Shielded Indv. Twisted Pairs	100 Ω ±30 Ω	EIA, TIA 10BASE-T	8-10	YES
IBM Type 1	Shielded Indv. Twisted Pairs	150 Ω	PCC FT 1	N/A	YES[1]

NOTE 1. To use IBM Type 1 cable, the 150 Ω Twisted Pair Type selection must be made in the CardAssistant Configuration menu.

Figure 2: `Usable and Unusable 10BASE-T Cable
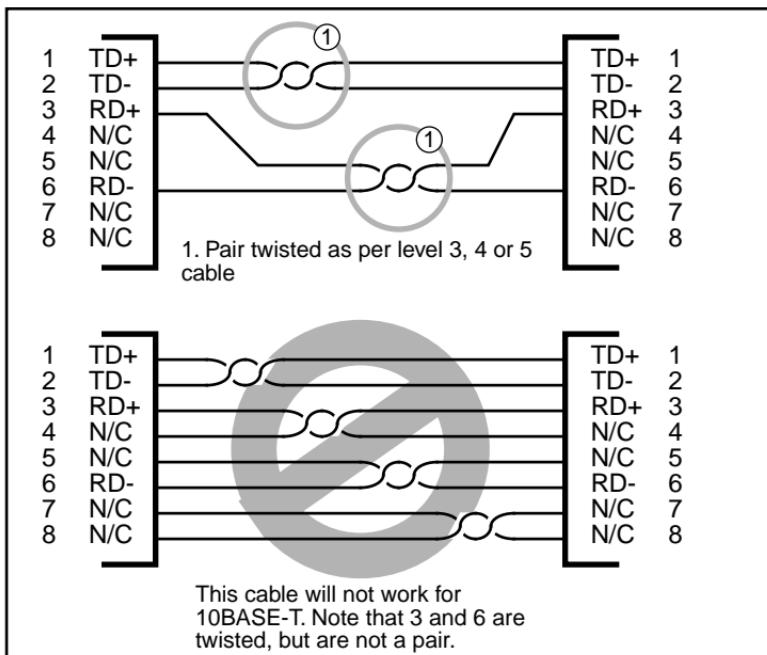

1. Pair twisted as per level 3, 4 or 5 cable

This cable will not work for 10BASE-T. Note that 3 and 6 are twisted, but are not a pair.

Figure 3 shows where to locate pin 1.
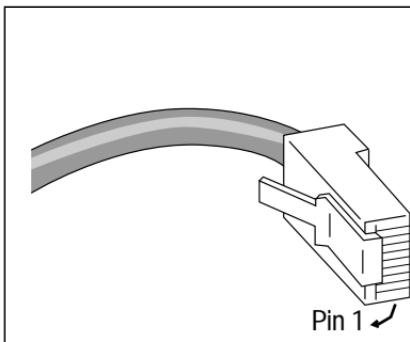
Figure 3: Pin 1 Orientation on an RJ45 Connector

Pin 1

10BASE2 RG58/BNC Cabling

In addition to an RJ45 connector, the AT-1700BT has a BNC connector for 10BASE2 standard thin Ethernet RG58 coaxial cable. The maximum segment length is 185 meters (606 ft.), and the minimum length between nodes is 0.5 meters (1.64 ft.). The coaxial cable should be connected to the adapter card via a T-connector and must be terminated with a 50 Ω BNC terminator if the computer is at the end of a network segment. See Figure 4. The connection must *not* be made as in Figure 5.
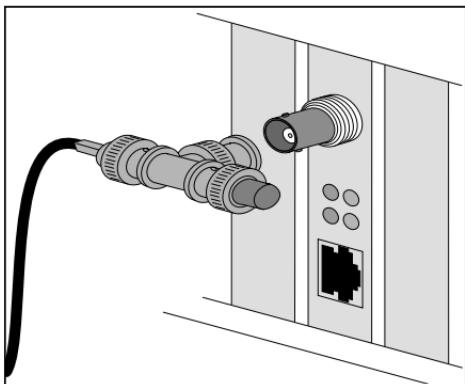
Figure 4: BNC Receptacle for 10BASE2 (Shown Terminated)
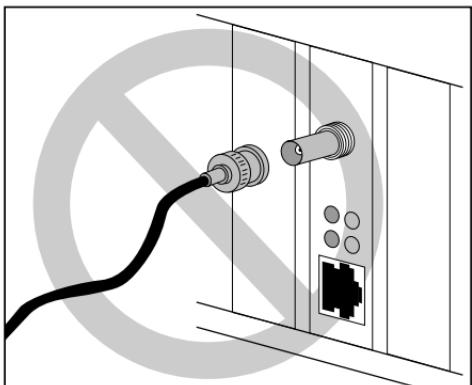
Figure 5: Incorrectly Connected BNC for 10BASE2

10BASE-FL/FOIRL (Optical Fiber) Connection

The AT-1700FT provides both an RJ45 for 10BASE-T Ethernet and ST-type transmit and receive connectors for 10BASE-FL or FOIRL Ethernet network segments. Maximum segment length is 1000 meters (3279 ft.) for FOIRL and 2000 meters (6558 ft.) for 10BASE-FL. (See Figure 6.)
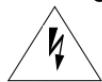
Warning Hazardous light emissions may exist in fiber optic systems. Severe eye damage may result if precautions are not taken. Never look into a transmitting fiber optic device, transceiver, repeater, or cable.

In a 10BASE-FL or FOIRL segment, the cables connect the transmit receptacle at one end of the segment to the receive receptacle at the other end and vice versa.
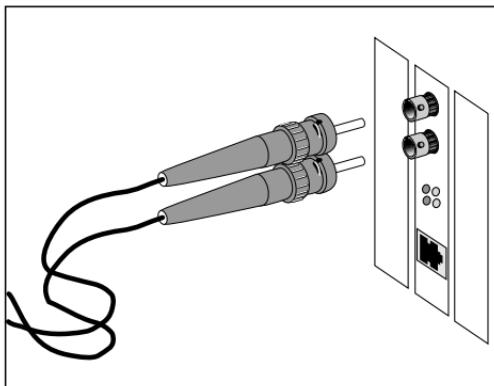
Figure 6: ST-Type Connector for 10BASE-FL/FOIRL Media

10BASE5 (AUI) Connection

The AT-1700AT offers both an RJ45 and an AUI port. (See
Figure 7 and Figure 8.)
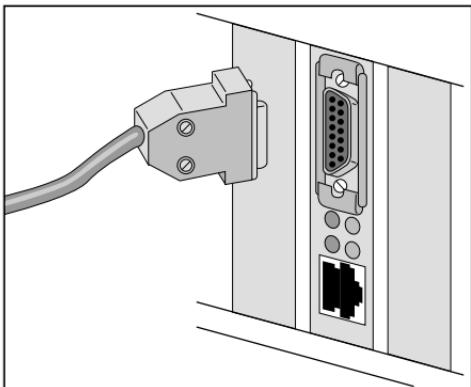
Figure 7: AUI Connector for
Thicknet Drop Cable
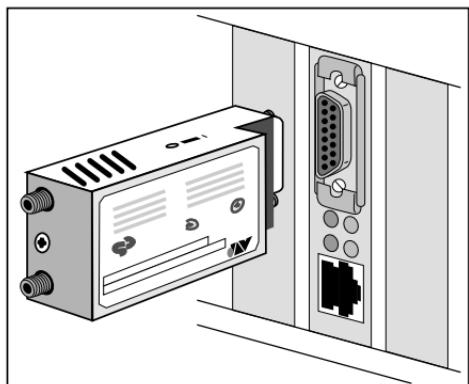
Figure 8: AUI Connector for
Direct Transceiver Connection

In Figure 7, you see a drop cable from a remote transceiver,
typically on a thicknet backbone. In Figure 8, you see the
transceiver installed directly on the AUI port. Installing the
appropriate ATI transceiver from Table 6 on the AUI port allows
you to interface with the medium of your choice.

Table 6: ATI Micro Transceiver Choices

Model	Description
AT-MX25F/AT-MX26F	Fiber Optic (FOIRL, 10BASE-FL)
AT-210T/AT-210TS/ AT-MX20T	UTP (10BASE-T)
AT-MX10/AT-MX10S	Thin Ethernet (10BASE2)

If a transceiver is installed, care must be taken with the setting of the heartbeat/SQE switch. Unless the transceiver is installed on a device that specifically requests that the heartbeat/SQE switch be ON, this switch should be set to OFF. Failure to set the heartbeat/SQE switch correctly will result in degradation or failure of network communication.

Communication Status Indicators

Table 7 shows the functions of the four status indicators located above the RJ45 receptacle.

Table 7: AT-1700 Status Indicators

LED Color	Label	Indicates	Used by
Green	TX	Transmitting packet	All media
Yellow	RX	Receiving packet	All media
Green	LNK	Valid receive link signal	10BASE-T FOIRL
Yellow	COL	Collision detected	All media

Chapter 8
Troubleshooting

A network is a complex combination of hardware and software, all of which must function for data communication to work. Problems are most likely to occur when the card is first being installed or when someone changes something in the network. A problem could be caused in your computer or in cabling or in many places elsewhere in the network.

If your computer is supported by a system administrator or network administrator, this person can often provide the most help in resolving a problem. ATI dealers also provide technical support for installation problems. But if one of these local resources is not successful solving your problem, you can obtain assistance directly from ATI by fax or by telephone. See Table 9 on page 45 for the nearest office.

Identify the Exact Symptoms

If your computer is unable to communicate across the network, carefully observe the symptoms. Gather information about the system and its components, such as device drivers, memory and extensions (e.g., QEMM), other peripheral cards and the use of I/O ports and IRQs. Log your interaction with the computer, noting the conditions, your actions and the responses. Analyzing this information will help you diagnose the cause of the failure. The technical support fax order form on page 43 can help you organize the information you need to begin resolving a problem.

Experiment with Possible Solutions

The first rule of troubleshooting is to isolate the problem. As you experiment, only vary one factor at a time. Substitute known good equipment and see if the problem persists or is eliminated.

❑ Do not overlook the obvious—make sure the card is seated in the computer and that the cables and connectors are securely attached.

❑ If the LINK LED does not light with UTP or fiber media, make sure the cabling is intact and connected to a functioning network port.

❑ If the LINK LED lights on a 10BASE-T segment, but data transfer is slow, collision-prone, or non-existent, verify that your cable is of level 3, 4, 5 , or IBM type 1 (see Chapter 7, Important 10BASE-T Cable Considerations). Level 1 and 2 voice-quality cable will not work properly.

If the cable is more or less round in section, you probably have data grade cable, correctly paired, and no transmission problems. If, however, the cable appears flat in section (as "Silver Satin" telephone-type cable) you probably have voice-grade cable and transmission problems. If it looks like telephone cable, double-check it.

❑ If the computer is on a 10BASE-T segment, make sure the "wire type" setting in the CardAssistant configuration menu matches the impedance of the wire. If the computer is on a 10BASE2 segment, make sure the cable is connected with T-connectors, terminated at the ends with 50Ω terminators, and grounded in only one place.

❑ If you suspect the network adapter card is not working properly, disconnect the computer from the network and run CardAssistant diagnostics after rebooting with no drivers loaded.

❑ If CardAssistant software does not detect the card, it could mean a conflict between the card and another device, a card

failure or a slot failure. You may need to reconfigure the adapter card or the other device to avoid the conflict.

Only one device in the computer can use each I/O port and interrupt vector. If two (or more) devices try to share resources, one or all do not function properly. Table 8 lists common uses of resources that can cause conflict.

▷ **To correct an I/O resource conflict**

Warning High voltages inside the computer present a safety hazard. Be sure the power is OFF before removing the cover.

Caution Only remove the card at a static-free workstation, with precautions to prevent damage to static-sensitive components.

1. Remove the card from the computer according to the manufacturer's reference manual.

2. Move the card to another computer. See "Installing the card in an ISA or EISA slot" on page 13.

3. Invoke CardAssistant (page 15) and run diagnostics again (page 18).

4. If diagnostics passes, change the adapter card configuration (page 14), and move the card back to the target computer.

5. Update the adapter card driver for the new settings. (See your network software manual.)

Table 8: Some Typical Device Uses of Bus Resources

This resource…	is customarily used for…
Base I/O Address	
300h-31Fh	Prototyping board; network adapter card
360h-37Fh	LPT1
380h-39Fh	SDLC; secondary bi-synch interface
RAM Address Space	
C0000h-C8000h	VGA
IRQ	
NMI	Parity errors
0	System timer
1	Keyboard
2	Cascade input for second interrupt controller
3	COM2
4	COM1
5	LPT2
6	Disk controller
7	LPT1; data acquisition, voice comm. adapter
8	Real-time clock interrupt
9	EGA/VGA
10	Reserved
11	Reserved
12	Reserved
13	Coprocessor
14	Hard disk controller
15	Reserved

▷ **To determine base I/O address and interrupt**

If the CardAssistant program does not detect the presence of the card, the address may be in a range that conflicts with another device on the bus. In this case, the only way to access the card is to change the base address setting of one device or the other. Either remove other card-cage peripherals that might have the same I/O address or move the AT-1700 to another computer.

▷ **To replace corrupted network software**

1. Temporarily move the files that refer to the adapter card driver and comment out references in your batch files.

2. Refer to your LAN administration manual for instructions on how to install your network software.

Manual/Adapter Card/CardAssistant/Driver Compatibility

This manual is intended for use only with the AT-1700 8-interrupt adapter cards with which it was shipped. The manual will incorrectly reflect the use of earlier adapter cards. Earlier cards may be identified with information from the file README.REV on the CardAssistant distribution diskette.

The Version 2.0 CardAssistant software and card drivers shipped with this manual are backward-compatible with respect to the AT-1700 adapter card, and will operate correctly with earlier versions of that card.

Get Technical Support

You can contact the dealer where you bought your AT-1700 for local assistance. If local help is unable to resolve your problem, ATI offers technical support via fax or telephone. In North America, support engineers are available between the hours of 6:30 a.m. and 5 p.m. Pacific time. Please photocopy and complete the technical support order on the next two pages. Then fax or

call the support office for your region. See "Technical Support Telephone Numbers" on page 45. The voice and fax telephone numbers for technical support are listed for each regional office.

Technical Support Fax Order

Name_____

Address _____**City**_____

Phone _____**Fax**_____

Company _____

State/Province_____ **Zip/Postal Code**_____

Computer Characterization

Processor ❏ 286 ❏ 386 ❏ 486 ❏ Pentium (586) **Bus** ❏ ISA ❏ EISA

Coprocessor _____ **RAM Memory** _____Megabytes

Chip Set ❏ Chips & Technology ❏ Suntec ❏ VLSI ❏ Headlin ❏ Opti

❏ G2 ❏ Bioteq ❏ Symphony ❏ Paradigm ❏ UMC ❏ Eteq

❏ DFI ❏ Del ❏ Hedaka ❏ IBM ❏ Other_____

BIOS ❏Phoenix ❏Award ❏AMI ❏Other _____Version _____

Ports LPT1 IRQ _____ COM1 IRQ _____COM3 IRQ _____

LPT2 IRQ _____ COM2 IRQ _____COM4 IRQ _____

Adapter Card ❏ AT-1700T ❏ AT-1700AT ❏ AT-1700BT ❏ AT-1700FT

IRQ _____ I/O address _____
Boot ROM: ❏installed ❏not installed

Adapter Card Driver Filename _____ Size____K Timestamp _____

Drive Controller (❏MFM ❏IDE ❏SCSI)

IRQ ____ Manufacturer _____Model/Rev _____

Video Display Adapter

IRQ ____ Manufacturer _____Model/Rev _____

Incident Summary _____

Conditions (List the steps that led up to the problem.)

_____

Detailed Description _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Please also fax printouts of your `AUTOEXEC.BAT` file and other batch and configuration files.

Table 9: Technical Support Telephone Numbers

Asia
Singapore, Taiwan, Thailand, Malaysia, Indonesia, Korea, Hong Kong, Philippines, China, India
Voice: (+65) 383-2050   Fax: (+65) 383-2079
France
France, Belgium, Luxembourg, Holland, Italy, Spain, Australia, New Zealand, Greece, Middle East, Africa, South America
Voice: (+33) 1-69-28-16-17   Fax: (+33) 1-69-28-37-49
Germany
Germany, Switzerland, Austria, Eastern Europe
Voice: (+01) 30-83-56-66   Fax: (+49) 30-435-70-650
North America
United States, Canada, Mexico
Voice: 1-800-428-4835   Fax: (206) 481-3790
BBS: (206) 483-7979
United Kingdom
United Kingdom, Denmark, Norway, Sweden, Finland, Iceland
Voice: (+0) 800-20-40-40   Fax: (+44) 1-865-390-002

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This limited warranty will not apply to any Adapter Card that: (a) has been modified or altered by any party other than ATI; or (b) has been damaged by deviation from the applicable environmental specifications; or (c) has been subject to accident or misuse.

In the event of a malfunction or other indication of product failure attributable directly to faulty workmanship and / or material, ATI will, at its option, repair or replace the defective products or components at no additional charge as set forth herein. Repair or replacement product will be furnished on an exchange basis and will be either reconditioned or new at the option of ATI. All replacement parts become the property of ATI. This warranty does not include service to repair damage to the product resulting from accident, disaster, misuse, neglect or modification of the product.

Service under this warranty may be obtained by returning the product to ATI, and only after receiving authorization by ATI by issuance of a Return Material Authorization (RMA) number, with shipping charges prepaid, in the original shipping container or like container, and with proof of purchase included with the returned product. The RMA number MUST be marked clearly visible on the outside of the shipping container. Any material returned without such RMA markings shall be rejected and returned to sender unopened.

Products will be returned to the purchaser after repair or replacement has been completed and by the carrier and method of delivery chosen by ATI, shipping paid by ATI. If the purchaser desires some other specific form of conveyance, then the purchaser shall bear the cost of the return shipment.

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Adapter Card Revision History

Revision Description	Date
Added AUI port option	8/93
Converted to high/low interrupt-request (IRQ) options	8/93
Converted to 8-interrupt (IRQ) selection	1/94

Adapter Card Manual Feedback

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On a scale of 1 to 10 (10 being most important), my uses of the manual information are:

CardAssistant Installation _____ CardAssistant Operation _____

Diagnostics _____ Card I/O Configuration _____

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